RESUME OF SERVICE CAREER

of

SAMUEL GRADY COCKERHAM, Brigadier General,

DATE AND PLACE OF BIRTH: 6 September 1925, Hamilton, Mississippi

YEARS OF ACTIVE COMMISSIONED SERVICE: Over 30 years

DATE OF RETIREMENT: 31 July 1978

MILITARY SCHOOLS ATTENDED

The Ground General School, Basic Course
The Field Artillery School, Basic Course
The Infantry School, Airborne Qualification Course
The Transportation School, Advanced Course
The Command and General Staff College
The Armed Forces Staff College
The Industrial College of the Armed Forces
The Aviation School, Fixed Wing and Rotary Wing Training Course

EDUCATIONAL DEGREES

United States Military Academy - BS Degree - Engineering
Purdue University - MS Degree - Economics
George Washington University - MS Degree - Business Administration

MAJOR PERMANENT DUTY ASSIGNMENTS (Last 10 Years)

FROM	**TO**	**ASSIGNMENTS**
Aug 67	Sep 69	Sp Asst for Strategic Mobility, OJCS
Sep 69	Dec 69	CO, AMMC, USARV
Dec 69	Jun 70	CO, 34th GS Grp (AM&S)
Jun 70	Mar 71	Dep CO (later CO), 1st Avn Bde, USARV
May 71	Apr 73	Dep CG, AVSCOM
Apr 73	Jun 76	PM, Adv Atk Helicopter, AMC

Jun 76	Sep 77	Dep Dir, J-4 (Strategic Mobility), OJCS
Sep 77	Jul 78	Chief, International Rat Office, DCSOPS, DA

PROMOTIONS	**DATES OF APPOINTMENT**
2LT	8 Jun 48
ILT	9 Jan 50
CPT	13 Jan 51
MAJ	19 Mar 59
LTC	20 Jun 63
COL	18 Jul 68
BG	1 Jul 71

US DECORATIONS AND BADGES

Distinguished Service-Medal
Distinguished Flying Cross
Legion of Merit
Bronze Star Medal w/3 Oak Leaf Clusters
Meritorious Service Medal
Air Medal
Army Commendation Medal w/2 Oak Leaf Clusters
Defense Superior Service Medal
Parachutist Badge
Master Army Aviator Badge
Joint Chiefs of Staff Identification Badge

SOURCE OF COMMISSION USMA (Class of 1948)

INTERVIEW ABSTRACT

Interview with **BG (Ret) Samuel G. Cockerham**

BG (Ret) Samuel G. Cockerham was interviewed by CPT Michael E. Mack on 2 July 1985 in Alexandria, Virginia. BG Cockerham is a graduate of the United States Military Academy, Class of 1948.

BG Cockerham discussed the different aspects of combat aviation maintenance and its importance to the overall success of an operation. To be successful, an aviation maintenance officer must be able to project the kind of damage his aircraft will probably receive, and be prepared to fix them. Keeping statistics over a period of time and noting the pertinent information necessary to keep accurate records will enable an aviation maintenance officer to properly plan his work schedule, supplies necessary, etc.

The 34th General Support Group played a key role in the overall aviation readiness posture of the military in Vietnam. BG Cockerham discusses the manner in which the 34th GSG operated, the supply requisitioning procedures and assets such as the Corpus Christi Bay maintenance ship.

The Lam Son 719 operation of 1971 was also described in detail. Aviation assets of the entire theater were at the disposal of the operation to ensure its success. BG Cockerham stated what was done from supply maintenance and aviation standpoints to ensure the air life of Vietnamese units was completed.

Development of maintenance teams in a combat environment was described, showing how quick reaction to emergency situations can have an effect on the outcome of a mission.

Retrograde management and problems that need to be addressed when developing these programs was also discussed.

BG Cockerham's view on the development of the helicopter as an offensive weapon close out his comments.

INTERVIEW

This is the Army Transportation Oral History interview of BG (Ret) Samuel G. Cockerham on 8 July 1985 by CPT Michael E. Mack at BG Cockerham's home in Alexandria, Virginia.

CPT Mack: Sir, could you describe the maintenance and logistics effort required to keep 600+ aircraft in the air during Lam Son 719.

BG Cockerham: Let me begin by providing some background information about Lam Son 719. After the invasion of Cambodia in 1970 a dramatic increase of activity along the Ho Chi Minh Trail alarmed the South Vietnamese and American authorities.

Intelligence reports indicated that the North Vietnamese were planning offensives against Cambodia and several provinces of South Vietnam at the end of the dry season. A preemptive strike was tempting and the risk worth taking. The South Vietnamese and Americans had turned the war around and were on the offensive. In December 1970 the U.S. proposed an offensive which was quickly approved by the South Vietnamese. Joint planning for Lam Son 719 began in January 1971 with barely a month to work out operations plans and to prepare units.

The principal objectives of Lam Son 719 were to interdict and disrupt the flow of enemy troops and supplies into South Vietnam along the Ho Chi Minh Trail in Laos. We hoped to cripple North Vietnam's ability to launch any offensives and simultaneously to buy more time and safety for the continued withdrawal of U.S. troops. No American ground combat troops or advisors were to accompany the Army of the Republic of Vietnam (ARVN) in the attack. The operations plan proposed four phases:

-- Phase I ("Dewey Canyon II")--a U.S. operation to reopen the base at Khe Sanh and to clear Route 9 as far as the Laotian border.

-- Phase II--an ARVN infantry and armor attack down Route 9 with northern and southern attacks to establish FSB protection on the flanks. Phase II had as its operational area a strip 10 to 20 miles wide (from north to south) that closed in on its objective, Tchepone (a town 40 kilometers west into Laos).

-- Phase III-an ARVN search and destroy operation against enemy troops and bases.

-- Phase IV--the orderly withdrawal of ARVN troops from Laos.

The operation was to last up to 90 days or until the onset of the rainy season. The 101st Airborne Division (Airmobile) commanded all U.S. Army aviation units in direct support of the Lam Son 719 operation [Figure 1].

I was the U.S. Army, Vietnam (USARV) aviation officer. As the former 34th General Support Group commander and the 1st Aviation Brigade deputy commander, I knew how to get things done to support the greatest test of airmobile operations. One of the first things I did was reposition the 1st Transportation Battalion (Aircraft Maintenance Depot, Seaborne) to Da Nang to provide a backup maintenance capability. We received authorization on a scheduled basis for a special-mission C-130 aircraft. We used it to transfer aircraft parts from the depots at Qui Nhon and Tan Son Nhut to support the operation. Sometimes there were direct flights from the United States to Da Nang. In essence, we had a closed-loop operation that reached from Qui Nhon to the Aviation Systems Command (AVSCOM) in St. Louis, Missouri. With inter- and intra-theater air transportation at my disposal, we were resourced to provide maximum support.

We entered Phase II as shown at Figure 2, which required unit-level cannibalization to meet each day's requirements. Cannibalization focused on aircraft in maintenance that lacked only one or two items (of the kind that could be transferred quickly from one aircraft to another) to be flyable. We also merged flyable aircraft from many units into the task organization. After reviewing the status of each aircraft by tail number, I determined which units would comprise the core and which aircraft would be moved from one unit to another (I moved aircraft from Company A to Company B, etc., to build a viable unit). My job was twofold:

(1) maintenance and supply

(2) training, personnel, aircrews

Our flying hour program produced a staggering number of periodic inspections (PEs) every month. We allowed four days to get each aircraft in and out and flew each aircraft an average of 75 hours per month. Combat

damage and loss statistics fluctuated constantly. [Figure 3 details number of damaged aircraft repaired through unscheduled maintenance as well as number of destroyed aircraft.] Lam Son 719 was carried out in a mid-intensity combat environment--by definition, a 50-caliber or larger threat. The North Vietnamese Army (NVA) was using 12.7mm and 14.5mm heavy machine guns to fire at us. My records show that 18 of the aircraft were never hit, 80% were combat-damaged and repaired at unit level, 15% were destroyed, and 4.9% were evacuated to depot.[1] During the period 5 February to 12 March (35 days) we flew 145,842 sorties in 57,796 flight hours, or a daily average of 4,167 sorties, 1,640 flight hours.

CPT Mack: I have another question on maintenance operations. When the combat aviation battalions deployed to move the ARVN in Laos, did you deploy your maintenance people as contact teams? I'm not talking just about the engine types but about the general mechanics. Did you deploy them as a team with the unit, or were they in a status where they were called up when needed to go out and repair an aircraft?

BG Cockerham: That's a good question. The commander is confronted with solving the little nagging problems of engines, fuel, and maintenance that keep aircraft on the ground. In Lam Son 719 the principal logistics management headquarters was at Quang Tri Base, the command post for the XXIVth Corps, where I was located with the 1st Aviation Brigade and the 34th General Support Group Tactical Command Post-North. The 101st operated from its field at Hue Phu Bai and was supported by the 5th Transportation Battalion. I concentrated my effort at Khe Sanh because that was my staging point. Besides elements of each aviation company operating in and out of the staging point, we also had a forward area rearm/refuel point (FARP) with CH-47 support to replenish it. The forward elements were responsible for the departure, return, and recovery of aircraft on a quick-reaction basis. I could form a team and have it functioning in a lot less time than the time required to get from Saigon to Khe Sanh.

CPT Mack: You talked about the maintenance management pipeline. What kind of problems did you experience with this pipeline?

BG Cockerham: When I commanded the 34th General Support Group, we had two IBM 360-65s with 400,000 bits of usable memory. I thought I had really hot stuff--I had a 35-man platoon for software redesign and I could do all sorts of things because nobody in the whole U.S. Army had an IBM 360-65 at his control to do all this work, except AVSCOM in St. Louis. With that computer and software I knew on a daily basis what the most demanded item in theater was. It took 55,000 line items to support all those aircraft flying almost 3 112 million hours a year. I knew the most demanded items, the highest dollar item, the item with the most money invested in it, and I could tell you which item was always at a zero balance. I could tell you

the ten most wanted items, forecast the requisitioning time and my order ship time. I could tell you the number of items that I did not have demand data on within one year.

I could also tell the Modification Work Order (MWO) status for each aircraft by tail number. I could tell the ones that were outstanding by company, by tail number. I could take this data, fly north, and go into one of the aviation companies of the 1st Aviation Brigade. I could go right into technical supply, open the visible card file, and check my federal stock number against theirs. I could see whether they were correct or not based on their requisition because I received the requisitions for all units coming into theater. I had about 150 technical representatives and 2,300 contract civilians when I commanded the Aviation Materiel Management Center (AMMC). These technical representatives and contract civilians were to do the "high time" periodic inspection (PE) on CH-47s at Air Vietnam. With a one-year turnover of personnel, we never did get soldiers trained well enough to do these inspections. A "high time" PE was a 1,200-hour inspection on the CH-47, and we had to depend on PE teams made up of about ten contract civilians to do these jobs. As a footnote, this is something for you maintenance people to pay attention to in the next combat situation. Are you going to have the skill levels? If not, where are you going to get them? I predict you're going to use civilians. I think that you're going to have civilian contract teams of all sorts, including supply, as I had, to be able to supply and support aircraft.

CPT Mack: General Cockerham, what are your observations on the direction aviation is headed regarding new aircraft coming into the inventory, aircraft on the drawing board, and the supportability of these new systems?

BG Cockerham: When I use the term "helicopter" (and I'm not restricting my definition to the helicopter in the purest sense), I'm simply referring to an aircraft that has vertical takeoff and landing characteristics. For our purpose, let's discuss the helicopter as a tank killer--long the dream of Army visionaries. All the aircraft that we used in Vietnam were really the product of World War II technology. They were designed to withstand aeronautical stress and strain. They were not designed, originally, to take hits. A new breed has come on the scene in the Blackhawk and the Apache. Their specifications are the product of lessons learned in Vietnam. They were designed with one principal criterion in mind: no single round could take down the aircraft. We designed the Blackhawk to take a 12.7mm round anywhere in the upper rotating controls and upper rotating parts (rotor hub, main transmission drive, tail rotor, etc). We also designed it to take a 7.62mm anywhere in the fuselage. As a gunship, the Apache would be confronted with fire-on-fire so it was designed to take a 12.7mm anywhere in the helicopter, and the rotor blade was designed to take a 23mm hit. In both helicopters, the fuel cell will take a hit from a 12.7mm round without fire,

and both have a 30-minute "get-home" capability. Actually, we just put more rubber around the bottom of the fuselage to dam up the fuel for a half hour to get us home.

Both the Blackhawk and the Apache were designed without any parasitic armor to protect the crew. The crew is still vulnerable. Ever since the French employed Boeing-Vertol CH-21s in the North African campaign in the mid-50s, we've learned not to protect the crew. I believe all Army equipment should be designed with a central thesis in mind: leave the tactics and techniques of helicopter employment to the troops who must fight the next battle. In combat, instances will occur where expected aircraft will not be available, and substituted aircraft will be forced to perform unpredicted missions.

Successful accomplishment of a specific mission could be critical to the commander's objectives. It's possible to imagine tactical situations in which any one of twenty combat helicopter missions would be critical.

To recap: In such situations, the rapid switch of mission equipment at the flight line becomes a most desirable feature in the design of future helicopters. This rapid switch is imperative for the combat helicopter to perform its multi-mission role without degradation of performance within the varied mission envelopes and profiles. Advances in airframe and non-airframe technologies and an increasingly sophisticated threat can be expected to continue to evolve during the life of all future combat helicopters. With the current U.S. inventory of Bell UH-1-series combat helicopters as the basic frame of reference, the helicopter can be expected to remain in use for 40 years or more. What has changed during the life of the UH-1 is the continual improvement in airframe dynamic components and other airframe/non-airframe subsystems.

Mission demands, survivability, crash-worthiness, and requirements for nap-of-the-earth work and for all-weather performance have prompted modifications to existing inventory helicopters such as the Advanced Helicopter Improved Program (AHIP) and the Cobra. These helicopters are severely limited in available cockpit space, structural dynamic performance, and electrical and engine power. They are at the limit of their weight and power growth potential, which has taken place over the past 20 years. To accept additional subsystems for them and to have improved combat effectiveness in today's and tomorrow's high-threat battle environment, a quick change in mission equipment is the next step. The current and preferred method of capitalizing on existing investments in combat helicopters in the inventory is a product improvement, evolutionary approach to performance design improvement. Growth of helicopter dynamic components (engines, gearboxes, drives, rotors, hubs, and blades) is a standard design approach. Yet an increase in the installed engine

horsepower also requires corresponding increases in the other dynamic components.

Upgrading avionics, armaments, visionics, navigation, sensors, and designators prompts the need for configuring such equipment into modules for community control, display, readout, and controlled instrumentation. This approach also uses an integrated avionics control system for communication, navigation, and target handoff and an electronic attitude indicator for cathode-ray tube (CRT) display of flight instruments.

Advances in systems technology will also allow for higher levels of systems and cockpit integration, to be achieved by a master monitor advisory display and remote solid-state power controllers. The displays provide integrated caution warning, electrical power control, and housekeeping engine and fuel control display monitorship for the crew. The U.S. MIL-STD 1553 data buss provides a means of systems interconnection. Circuit breakers and associated panels will be replaced with solid-state power controllers. Such improvements will provide the crew with a systems management capability greatly improved over existing methods and with less power and wiring--all done with improved tests and recent diagnostics. Development of electronic optical countermeasures will continue. High levels of complex electronic and optical surveillance sister systems will also be developed. As counters to the systems are developed, corresponding counter-countermeasure devices will be required. Due to anticipated demand in these areas, future helicopter design must provide more than space, weight, power, form, fit, function, and interchangeability of parts. Helicopters must be designed for a quick switch at the unit level of selected airframe subsystems and of all non-airframe subsystems mission equipment.

CPT Mack: Thank you, sir, for participating in the Fort Eustis Oral History Program.

[1] Three hundred ninety-four aircraft had bullet strikes: 89% had taken single hits, 7% had taken two hits, 1.5% had taken three hits, 1% had taken four hits, 1.5% had five or more hits.